Air-to-Air Missiles

WATRB XII Update

5 May 2004

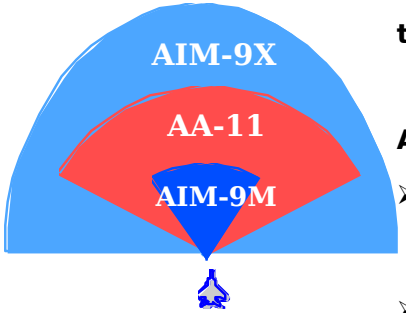
CAPT S. D. Stewart

AIM-9X Overview

Description

- Joint Service ACAT IC Program (Navy Lead)
- IOC: FY03 , MSIII: FY04
- Service Cost Sharing
  - Development
    - USN/USAF 50%-50% Funding
  - Procurement - 10,097 Missiles
    - Each Service Funds Own requirement
- 72 Month EMD Awarded Raytheon Missile Systems - Dec 96
- Primary Integration - F/A-18C/D, F-15C/D, JHMCS
- FOT&E - F/A-18E/F, F-15E, F-16, F/A-22

Threat / Program Objective



(Not To Scale)

- **Counter the AA-11 Archer threat to USN and USAF Fighter/Attack Aircraft**
- **Joint Operational Requirements Document (JORD)**
- USN-CAF (USAF 001-93-II-A) Dated 21 Feb 04
- Anti-Tamper Amendment Dated 26 Nov 97

Key Performance Parameters

- Day/Night
- IRCCM
- Off-Boresight Angle
- Aircraft Interface
- Probability of Kill
- Interoperability

AIM-9X

- **Dimensions: 119 Inches**
- **Weight: 187 Pounds**
- **Diameter: 5 Inches**

GFE: Rocket Motor Lots 1-2
AOTD Lots 1-7
Warhead Lots 1-12

AIM-9X Technology Roadmap

FY Procure	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20

P³I Phase 1 Start FY04

AOTD

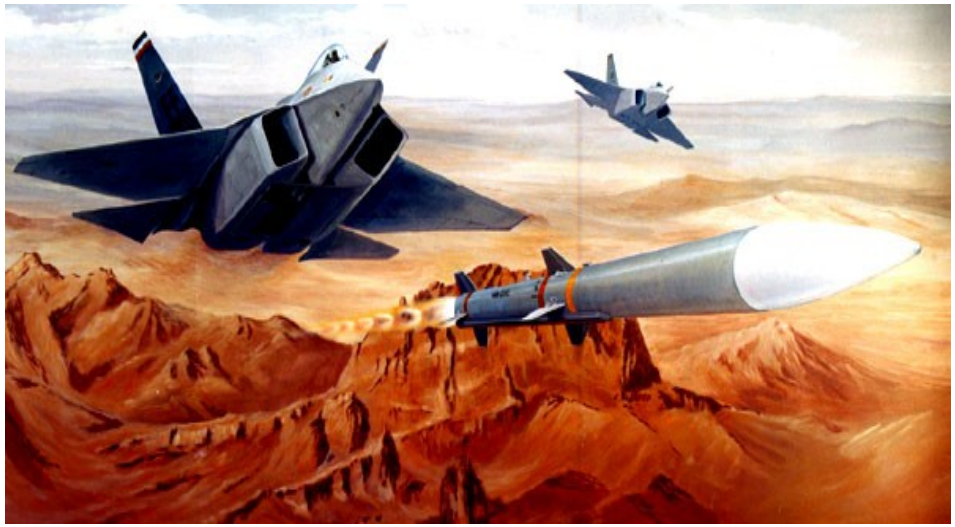
AIM-9X (Lots 8 and beyond)
Parts Obsolescence
Improve Pk

P³I Phase 2 Start TBD Not funded

Potential Candidates
In Requirements Def
Lock On After Launc
New Rocket Motor (
New Warhead (WH)

AIM-9X (Lots 10 and beyond)
Expanded LAR / Pk
Improved Targeting Capabilities
IM Compliant

AMRAAM Phase 4



Key Features

- Joint (USAF/USN) Development Effort
- Upgrades AIM-120C-7
  - GPS/IMU
  - Enhanced Datalink
  - Software Upgrade
- Delivers Performance Improvements in
  - Kinematics
  - Weapon Effectiveness (Pwe)
  - HOBS Engagements
  - Electronic Protection

Key Enabler for Multiple Strategies

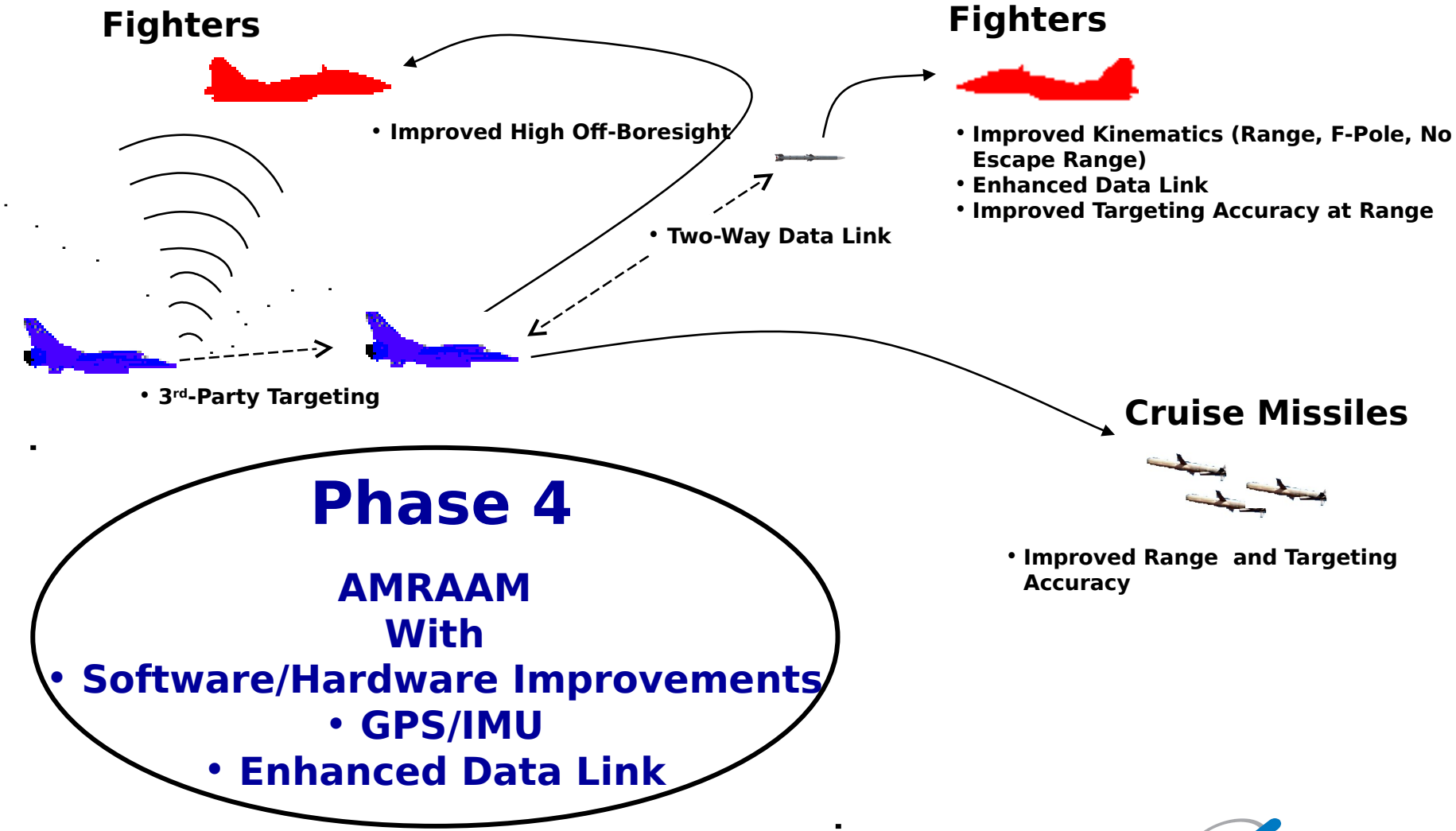
- Navy
  - Sea Shield; Sea Strike; NIFC-CA
- Air Force
  - Global Strike; Homeland Security; Global Persistent Attack; Global Mobility

Program Schedule

- SDD Contract Award – 1QFY04
- Initial Production – FY06
- IOCs
  - F/A-18E/F – 1QFY08
  - F/A-18A+/C/D – FY09
  - F-15C/D – 3QFY08
  - F-16 – FY12
  - F/A-22 – FY12

NAVAIR

AMRAAM Phase 4 Capabilities



AMRAAM Evolution

LOT AWARD

87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10

LOT DELIVERY FY

89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12

P³I Phase 4

AIM-120D

Lot 20-24 Improved F Pole, Advanced Data Link, GPS, HOBs, and No Escape Range

P³I Phase 3

AIM-120C-7

Lot 16-21 Major Upgrade to Guidance Section Hardware/Software

P³I Phase 2

AIM-120C-6

Lot 13-15 Upgrade to Target Detection Device, Improved Software

P³I Phase 2

AIM-120C-5

Lot 12 Upgrade to Control Section; Longer Rocket Motor
FMS Product Offering Beginning Lot 15

P³I Phase 2

AIM-120C-4

Lot 11 Improved Warhead; Improved Software

P³I Phase 1

AIM-120C

Lot 8-10 Minor Hardware Upgrade to Guidance Section; Smaller Wings/Fins, Improved Software

AIM-120B

Lot 6-7 Major Hardware Upgrade to Guidance Section; Annex G Software Upgrade Exploited Hardware Capabilities - FMS Product Offering Lot 7-14

AIM-120A

Lot 1-6 New Active Radar Missile

PMA-259: Long Term Unfilled Technology Needs

- Processing
  - Affordable, High Speed Processing
- Targeting Capabilities (AIM-9X)
  - Acquisition and Track capability improvements
    - Improve IRCCM performance
  - Lock-on-after-launch (LOAL) capability
  - Multi-targeting capability
    - Simultaneous designation and launch of missiles from single aircraft

PMA-259: Long Term Unfilled Technology Needs

- Network Centric Warfare
  - Enhanced Data Link / 2 Way Data Link
- New Rocket Motor (AIM-9X)
  - IM Compliant (SCO, BI and FI)
    - composite case, etc.
  - Improved Performance
    - Diameter, Propellant, etc

UNCLASSIFIED

PMA-259: Long Term Unfilled Technology Needs

- Navigation / XFER Alignment
  - GPS Lot 22 for AMRAAM Guidance
  - Trajectory Optimization Techniques (AIM-9X)
- Control Systems
  - Reaction Jet Flight Controls
- Electronic Protection
  - Improved performance / capability
- New Warhead (AIM-9X)
  - IM Compliant (FI)
  - Improved Lethality
    - Mass Focus

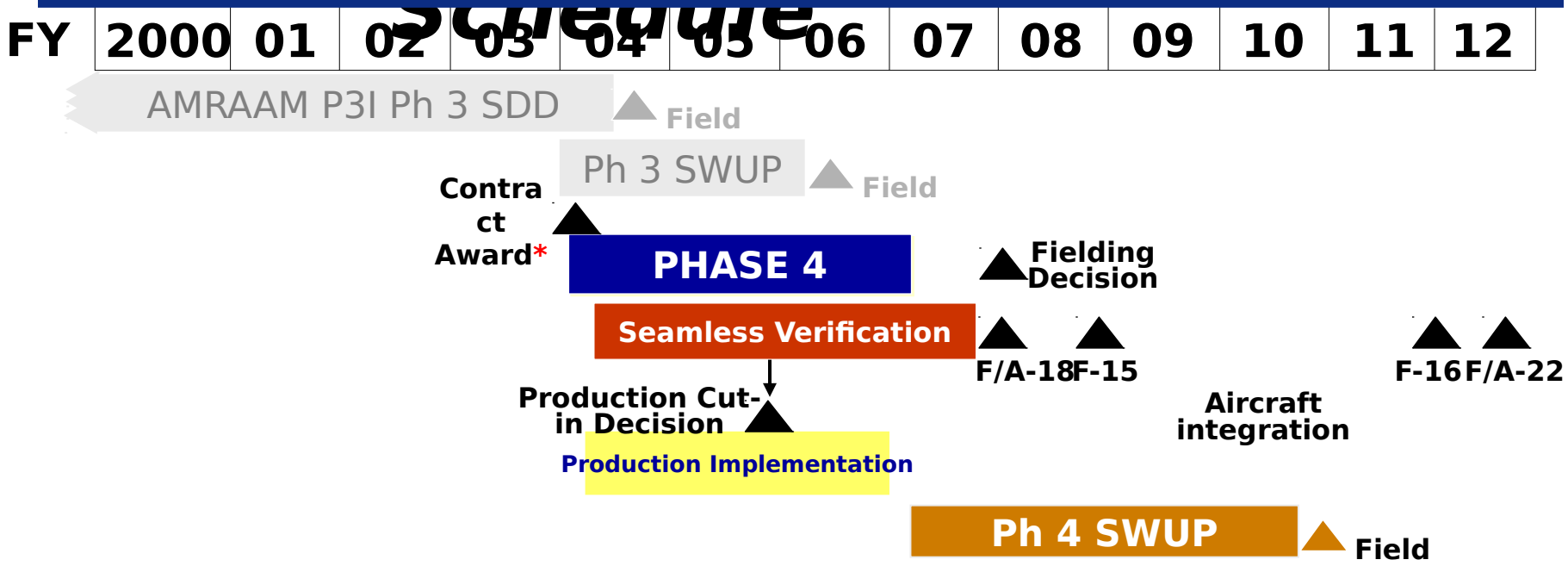
UNCLASSIFIED

Summary / Questions

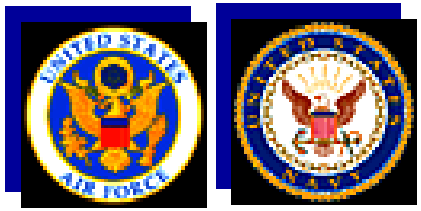
- AIM-9X / AIM-120C-6/7/D0 Short Range / Medium Range Missiles will take us to the next decade
- Requirements Definition / Technology Evaluation in Work for P3I Capability Improvements

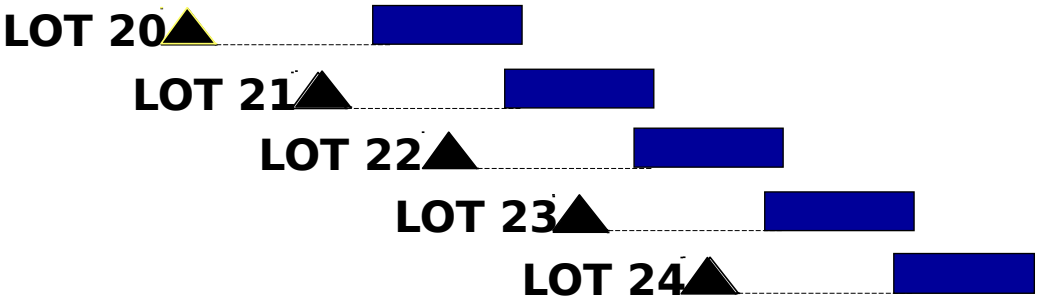
BACKUP

Phase 4 Program Schedule



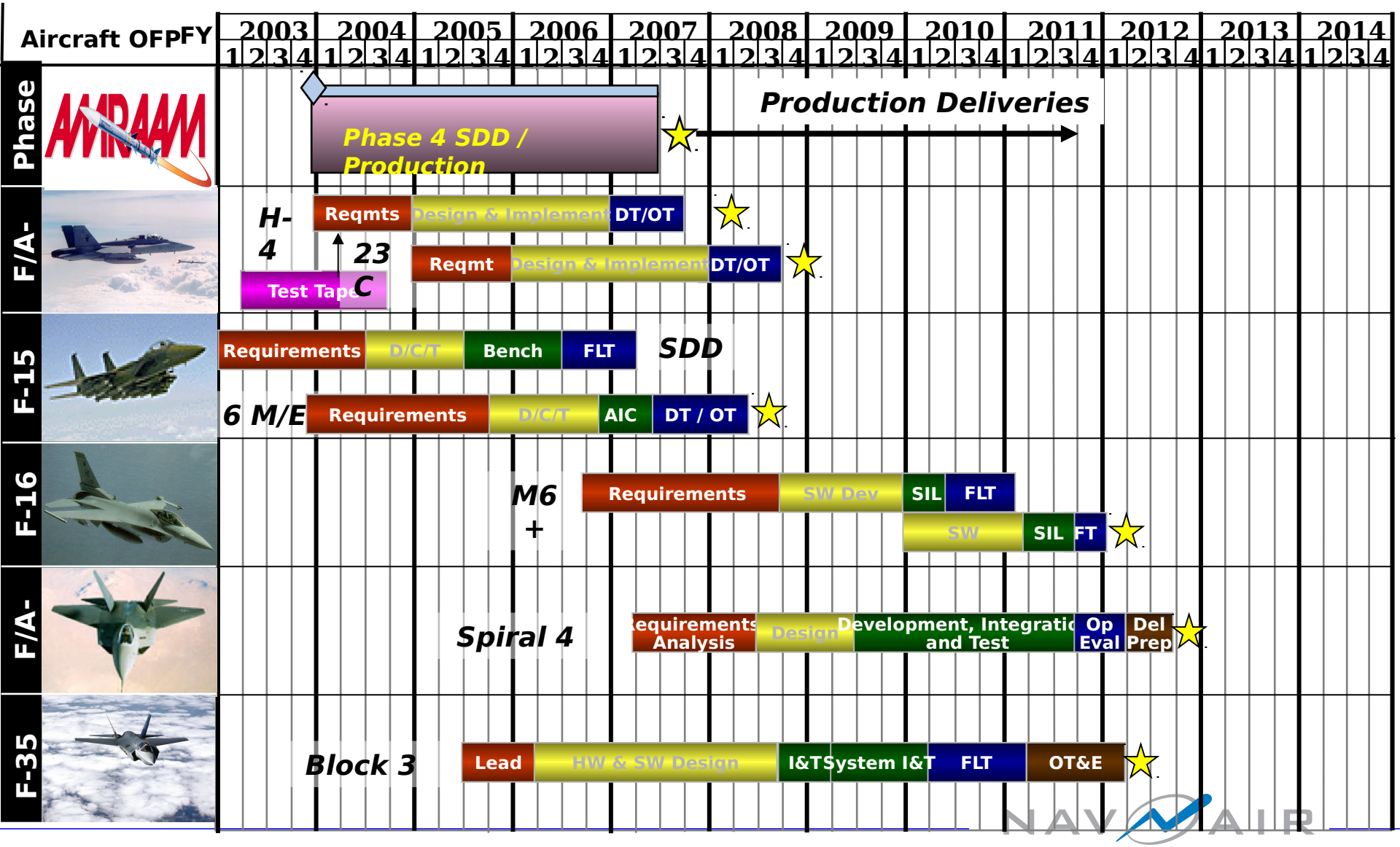
Joint Development & Production





* Dependent on FY04 Funding

Phase 4 Integration Top Level Schedule



Navy AMRAAM Roadmap

The Navy Team

FY Procure	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09

Baseline APREP

AIM-120A & AIM-120B (Lots 3-7):
BVR, All Weather, Look-Down-Shoot-Down, Multi/Cluster Targets. AIM-120B Added Improved EA and Reprogrammability
Navy Quantity = 543 + 224 = 767

P³I Phase 1

Compress Carriage

AIM-120C-3 (Lots 8-10)
Improved EA, Increased F-22 Loadout
Navy Quantity - 296

P³I Phase 2

Warhead, Fuze, +5" I

AIM-120C-4/5/6 (Lots 11-15)
Imp EA, Kinematics, Lethality
Navy Quantity = 474

P³I Phase 3

M-120C-7 (Lots 21)
EA, Lethality Navy Planned Buy =308 (563 TC)

P³I Phase 4

AIM-120-TBD
DataLink, GPS, Kinematics via S/W, Lot 19

AIM-9X: The Road Ahead